
SECTION 3.0 - PURPOSE AND NEED

3.0 PURPOSE AND NEED

3.1 Project Purpose

The linkage between the need for dredging in New Bedford/Fairhaven Harbor and the regulatory challenges involved with the disposal of UDM, associated with dredging projects identified in the New Bedford/Fairhaven Harbor Plan, forms the basis for the New Bedford/Fairhaven Harbor DMMP. While this section describes dredging needs for New Bedford/Fairhaven Harbor, the focus of this DEIR is on disposal options for UDM. This section also characterizes the quality and quantity of dredged sediments for dredging projects, establishing the magnitude of UDM requiring disposal and the types of measures and site characteristics required for safe disposal of UDM.

As discussed in Section 2, the lack of a practicable cost-effective method for the disposal of UDM in an environmentally sound and cost effective manner has been a long standing obstacle to the successful completion of dredging projects in New Bedford/Fairhaven Harbor. The basic project purpose of the New Bedford/Fairhaven Harbor DMMP, is to identify, evaluate and permit, within the New Bedford/Fairhaven Harbor upland or aquatic Zones of Siting Feasibility (ZSFs) a site (or sites) or alternative treatment technology, for the disposal of UDM over a ten year planning horizon for both public and private dredging projects. The inability to find a practicable, environmentally sound, cost-effective method for disposal or management of UDM will restrict the maintenance and improvement of New Bedford/Fairhaven's waterways and ultimately, full implementation of the New Bedford/Fairhaven Harbor Plan.

3.2 Harbor Planning Context

The February 1996, passage of the Seaport Bond Bill, included a provision for funding assistance to the state's major commercial ports to conduct comprehensive harbor development and management plans. This "Four Ports Initiative," undertaken by Gloucester, Salem, New Bedford and Fall River with technical assistance from CZM, on behalf of the Secretary of the EOE, is being closely coordinated with the DMMP. As part of the local harbor planning process, New Bedford/Fairhaven has developed a Harbor Plan to guide the development of the harbor for the five (immediate term) and ten (long term) year planning horizons, providing a framework for future decisions related to port development.

A Harbor Plan, approved by the Secretary of the EOE, is a document having significant impact upon the viability of planning initiatives in the port. The plan allows New Bedford and Fairhaven to have greater flexibility in implementing a development strategy tailored to its individual needs and the City and Town's visions of economic development and environmental quality. The plan also identifies funding needs which are critical to its implementation. The development option put forward in the plan represents New Bedford and Fairhaven's mutual harbor planning goals and vision for the next ten years.

The preparation of the New Bedford/Fairhaven Harbor DMMP, also funded through the Seaport Bond Bill, has been coordinated with local planning efforts. Coordination with local harbor planning interests has been an important component of the development of this DEIR. The simultaneous preparation of the harbor plan and the DMMP has helped with the identification of New Bedford/Fairhaven Harbor's future dredging needs as well as potential sites for the disposal of UDM.

3.3 Project Need

This section describes the need for the New Bedford/Fairhaven Harbor DMMP in three primary areas: dredging history; future dredging needs; and, sediment quantity and quality.

3.3.1 Dredging

3.3.1.1 Dredging History

Based on dredging records collected in the Massachusetts Navigation and Dredging Management Study that was completed by the USACE for the State of Massachusetts (USACE 1995), a total of 7,028,465 cubic yards of material have been historically dredged from New Bedford/Fairhaven Harbor. Much of this volume was dredged prior for the initial creation of the federal navigation channels and the construction of the hurricane barrier in 1966. No major dredging has occurred since that time, except for dredging in the upper estuary as part of the Superfund remediation project.

3.3.1.2 Dredging Inventory

The volume of sediment to be dredged from New Bedford/Fairhaven Harbor over the next twenty years was estimated through surveys conducted by the USACE (1996) and Maguire (1997).

The total volume of sediment to be dredged from New Bedford/Fairhaven Harbor over the next twenty years was estimated at 2,555,280 cy (2.6 million cy). This included the dredging needs of federal, state, local and private parties with channels, turning basins, or marinas within the harbor. This number also included a contingency of 20% that was added to account for any uncertainty in the volumes provided by the marine users and to accommodate any unplanned dredging projects that may arise in the future. However, the volumes presented in the sub-sections below are *without* the 20% contingency.

During the 1997 survey, all shoreline marina owners, municipalities, utilities, state and federal agencies were contacted via a mail-back questionnaire, with follow-up telephone calls to non-respondents. Marine users were asked to complete a questionnaire, denoting dredging footprints, volumes, and anticipated time schedule over the next 20 years.

The listing for New Bedford and Fairhaven included 18 facilities associated with the receipt or shipment of commodities in deep draft vessels, 17 facilities associated with commercial fishing, and 8 marinas and yacht clubs for recreational craft (ACE 1996). In terms of volume, the maintenance dredging of the federal channels in New Bedford and Fairhaven was forecasted to account for 84% of the total 20-year desired dredging volume identified. Six percent of the volume is from state and local dredging projects and 10% is from private marinas for a total of 16% from private and public non-federal projects.

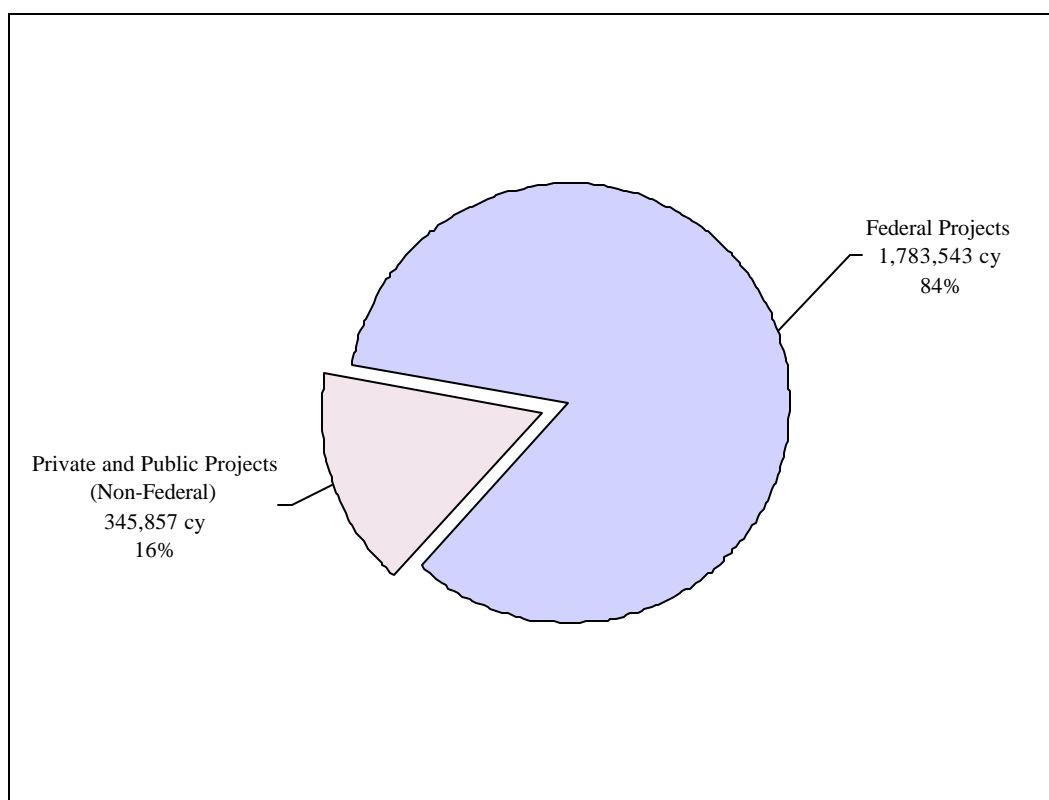


Figure 3-1: Twenty-year Dredging Volume Breakdown by Sponsor Type

New Bedford/Fairhaven Harbor contains 30 ft, 25 ft, 15 ft, and 10 ft federally authorized channels (Figure 3-2) which are currently shallower than their authorized depths. As shown in Table 3-2, the 30-ft. federal channel and maneuvering areas combined account for over 90% of the desired dredging in the federally authorized navigation areas. Approximately one-third, 400,000 cy, of this 1.2 million cy of desired dredging in the 30-ft channel/maneuvering area would occur in the outer harbor.

The 15 ft and 10 ft entrance channels to Fairhaven Harbor require approximately 8,000 cy of dredging. The 25 ft. anchorage area between the main channel and the Fairhaven channels requires about 80,000 cy of dredging. There are numerous areas that require maintenance dredging (Table 3-1) over the next 20 years. Among the largest projects are the Fish Terminal Wharf, U.S. Coast Guard, and the State Pier.

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Table 3-1: Projected Twenty-Year Dredging Volumes for New Bedford/Fairhaven Harbor
(based upon original dredging inventory conducted)

Inventory ID	Project Name	Volume (cy)	M or I	Volume Suitable	Volume Unsuitable	Dredging Year
NB1	Cape Island Express Line Pier	0				0
NB2	City South Terminal Wharf	0				0
NB3	Global Petroleum - Main Dock	0				0
NB4	Global Petroleum - Fuel Dock	0				0
NB5	City - Leonard's Wharf	0				0
NB6	City - Homer's Wharf	0				0
NB7	City - Coal Pocket Pier	0				0
NB8	City - Steamship Pier	0				0
NB9	State Pier	0				0
NB10	City - Pier 3 Fisherman's Wharf	3,333	M		3,333	5
NB11	New Bedford Seafood Corp.	0				0
NB12	Crystal Ice Co. Wharf	0				0
NB13	Maritime Terminal Wharf	30,000	M		30,000	5
NB14	Frionar USA Wharf	3,500	M		3,500	5
NB15	MA Towing Co.	0				0
NB16	City of New Bedford	0				0
NB17	Packer Marine	1,000	M		1,000	5
NB17	Packer Marine	1,500	I		1,500	5
NB18	Fish Terminal Wharf	10,000	M		10,000	5
NB19	Gear Locker Marina	8,000	M		8,000	5
NB19	Gear Locker Marina	8,000	I		8,000	5
NB20	The Olde NBYC	0				0
NB21	Bayline Marina Inc.	0				0
NB22	Popes Island Marina	0				0
NB23	Cozy Cove Marina	1,500	M		1,500	5
NB24	Seaport Marina	0				0
NB25	US Coast Guard	15,407	M		15,407	10
NB26	Linberg Marine Berth	5,000	M		5,000	5
NB26	Linberg Marine Berth	2,000	I		2,000	10
NB27	Acushnet Fish Co. Pier	11,000	M		11,000	10
NB28	DN Kelly & Son Wharf	61,000	M		61,000	5,10
NB29	Town of Fairhaven	3,524	M		3,524	5
NB30	Norlantic Diesel Fuel	16,500	M		16,500	5
NB31	Hathaway/Brale Wharf Co.	1,000	M		1,000	5
NB32	Fairhaven Shipyard/Marina W.	0				0
NB33	State Pier - to Fed. Channel	60,000	M		60,000	5
NB34	Ferry Pier	35,000	M		35,000	5
NB35	Fairhaven Boat Ramp-Town Pier	25,000	M		25,000	5
NB36	Federal Channel	1,318,136	M		1,318,136	5
NB36	Federal Channel	150,000	M		150,000	10
NB36	Federal Channel	150,000	M		150,000	15
NB36	Federal Channel	150,000	M		150,000	20
NB41	Nimiec Marine	26,000	M		26,000	10
NB42	Whaling City Marine	23,000	M		23,000	10
NB43	D.W. White Construction	10,000	M		10,000	10
TOTAL		2,129,400		0	2,129,400	
TOTAL	CONTINGENCY (20%)				425,880	
	WITH CONTINGENCY				2,555,280	
Notes:	M = maintenance I = improvement					

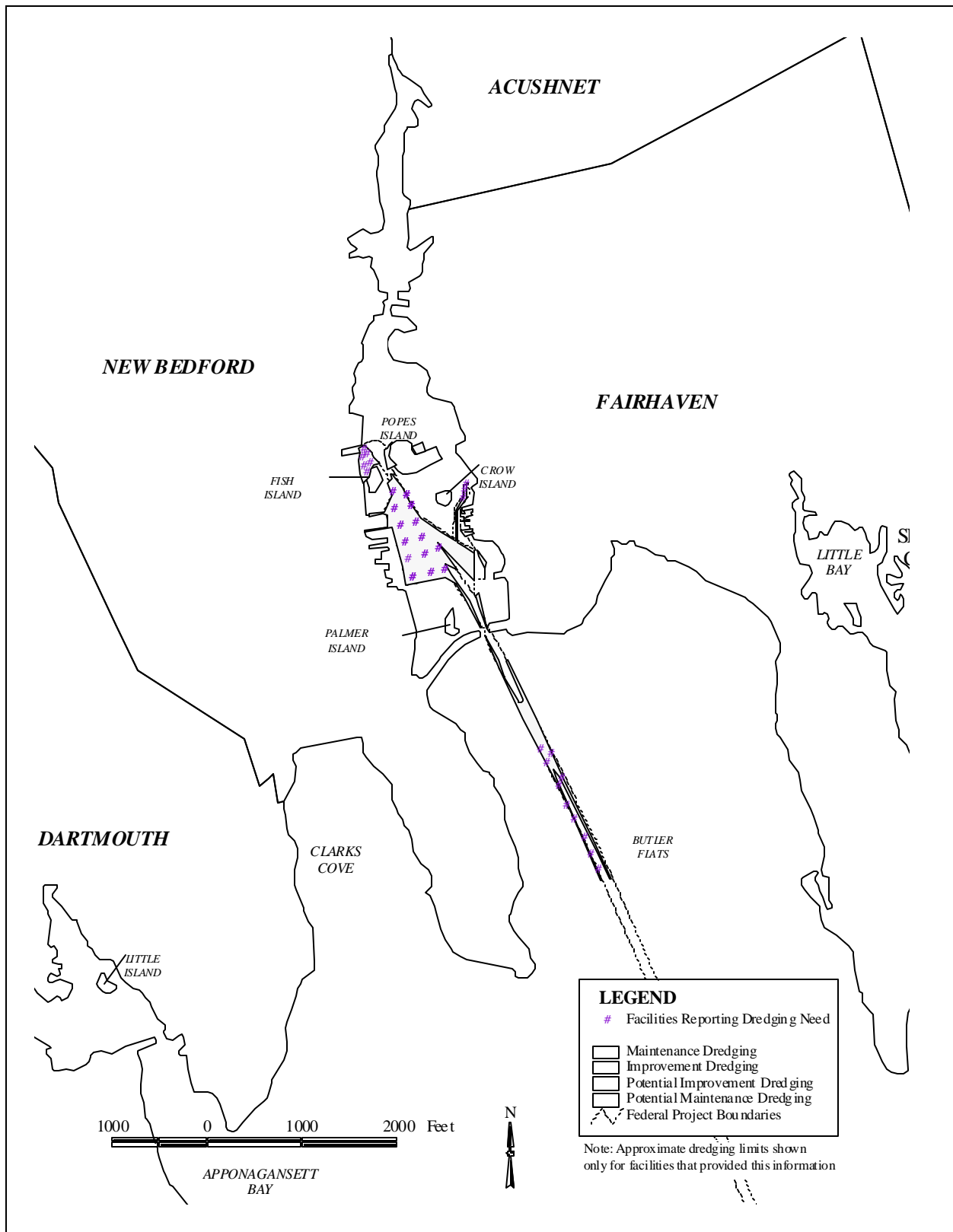


Figure 3-2: Federal Navigation Channels and Potential Long-Term Dredging Areas

In addition to investigating the need for dredging as it directly relates to navigation and economic development, the need for dredging as a result of the natural process of sediment entering New Bedford/Fairhaven Harbor was evaluated to ascertain future maintenance dredging needs not identified in the original dredging inventory. After a review of hydrographic surveys over the past several decades, since the hurricane barrier was constructed, it was estimated that the harbor is shoaling at an average rate of approximately 63 cy/acre/year (USACE, 1996), which equates to about 23,000 cy/year over the entire federal channel area in the lower harbor. This volume was added to the original estimate of maintenance dredging. This investigation also confirms that three additional maintenance dredging cycles would be required to maintain authorized depths over a 20 year period involving about 150,000 cy of dredging per cycle if the project moves forward.

3.3.1.3 Baseline Dredging Demand

Accounting for recent developments in economic conditions, dredging need identified for the twenty-year planning horizon, has been adjusted to establish baseline dredging demand for a ten-year period. The rationale for this adjustment is founded on the assumption that the ten-year period most accurately represents the volume of dredging that is likely to occur within the *Harbor Master Plan's* concurrent implementation time frame. The baseline dredging demand used in the New Bedford/Fairhaven Harbor DMMP is 960,000 cy. This number was adjusted downward from the 2.6 million cy identified in the dredging inventory as described above. The adjustment made reflects the current lack of economic justification for federal participation (funding) to conduct the complete dredging of approximately 1,320,000 cy (1.3 million cy) of material for the main federal channel. After follow-up discussions with the USACE, federal navigational maintenance dredging that is likely to go forward includes approximately 80,000 cy for the Fairhaven channel and 200,000 cy in the New Bedford channel. Coupled with the projected ten-year estimate of 680,000 cy of dredged material coming from private and public (non-federal) projects, unchanged from the original dredging inventory, an estimated baseline dredging demand of 960,000 cy was established (Figure 3-3). This baseline dredging demand volume was used to identify, plan and permit a disposal site(s) with sufficient capacity to accommodate the needs for New Bedford/Fairhaven Harbor.

The remainder of the original volume will be carried forward and discussed in the context of the capacity of the Proposed Preferred Alternatives for conceptual future disposal plans (2011 – 2020) in Section 8. The City does not view this as curtailing New Bedford's ability to proceed, after the DMMP as an independent applicant under an unrelated action and associated Basic Project Purpose, for an additional range of disposal alternatives for future federal improvement work that accommodates additional City objectives (marine and transportation infrastructure development).

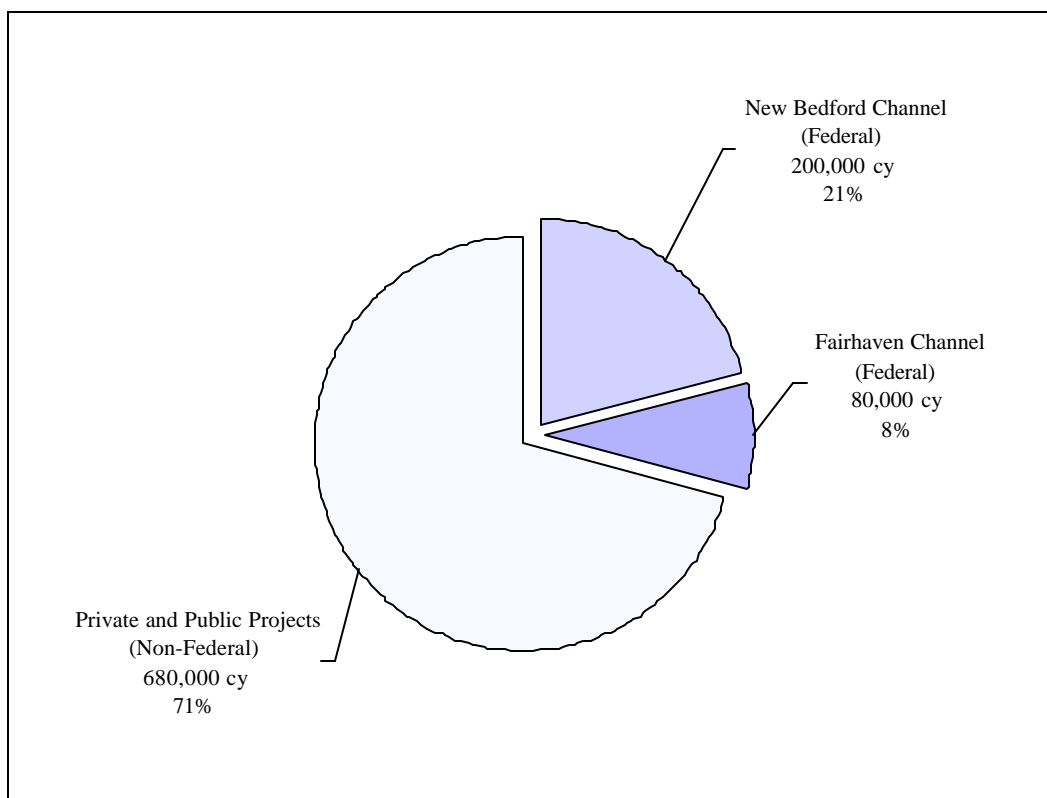


Figure 3-3: Ten-year Dredging Volume Breakdown by Sponsor Type

3.3.2 Sediment Quality and Quantity

3.3.2.1 Sediment Quality - Conformance with Regulatory Requirements

The evaluation of sediments proposed for dredging is conducted by federal and state regulatory agencies. The USEPA, USACE, NMFS, USFWS, DEP, and CZM, through an interagency agreement, are responsible for development and review of all sampling and testing for dredging and dredged material disposal in Massachusetts. At the state level, DEP and CZM review sampling and testing under the purview of the Coastal Zone Management Act (CZMA) and Section 401 of the Clean Water Act (CWA). The federal agencies jurisdiction comes from Section 404 of the CWA. Sampling and sediment testing for the New Bedford/Fairhaven DMMP DEIR followed published protocol of the USEPA and USACE. The protocol (USEPA/USACE, 1991) involves a tiered approach. Tier I involves a literature search on potential contaminant sources, history of dredging, natural harbor features and other factors.

Tier I - Identification of Potential Pollution Sources

The historical discharges of pollutants into the harbor have been well documented as part of USEPA's Superfund cleanup efforts (USEPA, 1998) and subsequent studies (Maguire, 1997; VHB, 1996). Due to the harbor's industrial nature, particularly in New Bedford, industrial pollutants such as metals and organic compounds have been discharged to the river. Those chemicals that have a strong affinity to sediments have settled to the harbor bottom. The water-soluble chemicals were likely flushed into the outer harbor and Buzzards Bay.

The major pollution sources in the harbor include: Aerovox, Revere Copper Products, Fairhaven Wastewater Treatment Plant, Cornell Dubilier Plant and the New Bedford Municipal Wastewater Treatment Plant (Figure 3-4). Of these, Aerovox and Cornell Dubilier have been implicated as Potentially Responsible Parties (PRP), in the discharge of PCB-laden chemicals to the harbor, which has caused significant environmental damage to water quality and biota in the harbor. The discovery of this contamination in the mid 1970s eventually led to the closure of fishing and shellfishing in the harbor and the investigation of means to remediate the most contaminated areas of the harbor. Since then, USEPA has worked to develop a remedy for the situation and has developed a plan to excavate the most contaminated sediments from the harbor and place these sediments in a series of confined disposal facilities (CDFs) (Figure 3-5). The USEPA is also currently exploring other non-CDF disposal alternatives.

While the Aerovox and Cornell Dubilier facilities were cited as major contributors of pollutants to the harbor, there were many other, small facilities that also discharged contaminants. Among these are combined sewer outfalls (CSOs) which discharge directly to the harbor. CSOs are pipes that carry a combination of sewage and stormwater. The utility infrastructure of much of New Bedford and Fairhaven is old and many CSOs still exist, although efforts are underway to separate the existing municipal sewer and stormwater systems.

Tier II - Physical and Chemical Analysis of Sediments

The first step of Tier II involves the physical analysis of samples (grain size, organic carbon content). These results are reported to the USACE, which, in turn determines which samples are to be composited for bulk chemical analysis. The only sediments that would not require further testing are those that consist of greater than 90% sand and/or are in areas of high currents and no major pollution sources as determined by USACE. In New Bedford/Fairhaven, there are no sediments that meet this criteria. The harbor is almost entirely a depositional area because of relatively slow currents and tidal action, and major pollution sources exist throughout the harbor.

After the bulk chemical analysis is complete, results are presented to the federal agencies for their review and evaluation. According to USEPA, if a substance is detected in sediments above "trace amounts", biological-effects testing (Tier III) is required to prove if sediments are suitable for unconfined ocean disposal. USEPA interprets "trace amount" as being any concentration that is above laboratory detection levels. If all substances are below trace levels, then no additional testing is required and sediments are deemed suitable for ocean disposal.

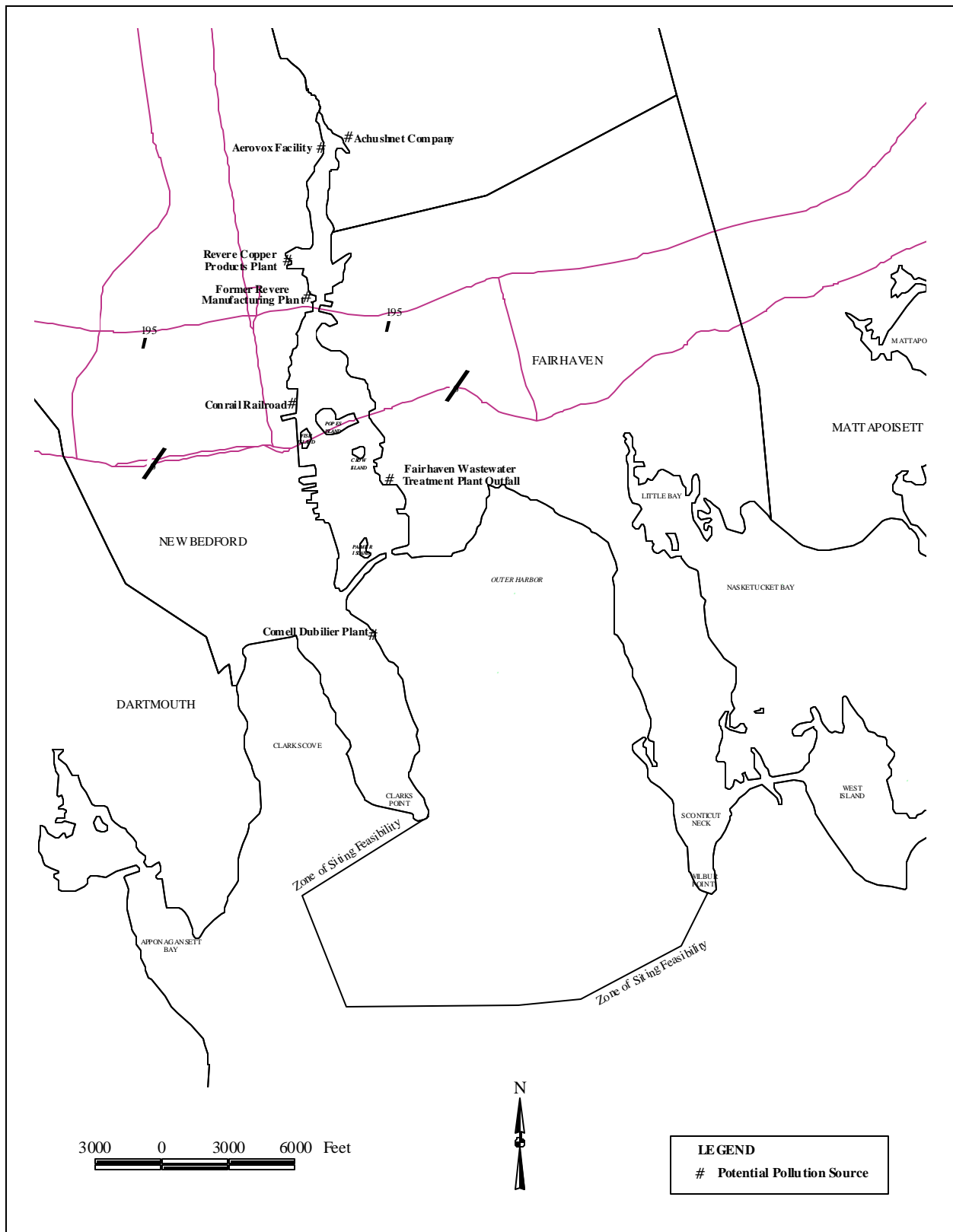


Figure 3-4: Potential Pollution Sources

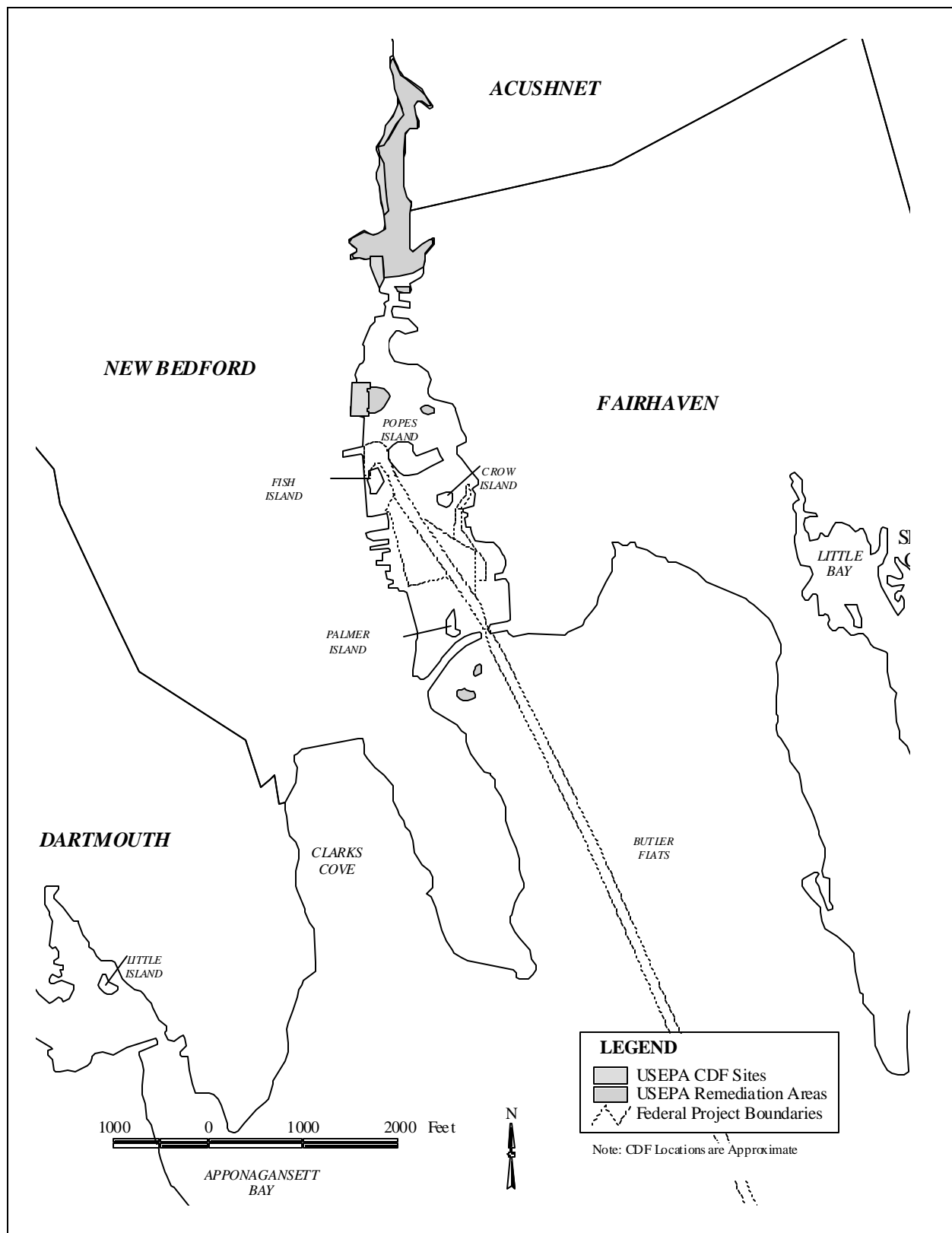


Figure 3-5: USEPA Remediation and Disposal Areas

The inventory of potential pollution sources and historic sediment quality data in and near New Bedford/Fairhaven Harbor in Tier I was used by the regulatory agencies to develop site-specific sampling and testing plans for the dredging of the federal navigation channels, maneuvering and anchorage areas. These areas were chosen for site-specific study because in total, they account for about 80% of the total anticipated dredged volume in the harbor over the next 10 years.

Sampling and testing plans are developed in a coordinated effort by USEPA, USACE, NMFS and USFWS with input from DEP. The sampling plans for New Bedford/Fairhaven Harbor were completed in the winter of 1998. Sampling and testing was conducted in the summer of 1998. A summary of the results is presented below and detailed results appear in Appendix D.

Surficial sediments in the lower harbor channel, maneuvering and anchorage areas are fine-grained, generally grey to black in color and anoxic, with some sulfur odor. These sediments consist of 90% silt or finer (clay) material.

Sediments just below the surface (2 ft. or below the sediment surface) in the lower harbor maneuvering are also composed of primarily silt and clay-size particles, however, inclusions of sand, gravel, and shell fragments do occur in some areas. Nevertheless, the sediment matrix of these sediments is primarily silt.

Sediments to be dredged within the outer harbor channel are also composed of organic silts, with small inclusions of sand.

Sediments were analyzed to determine metals, polycyclic aromatic hydrocarbon (PAH), pesticides, polychlorinated biphenyl (PCB), and dioxin/furan content. All these classes of chemical have been detected in previous samples in the harbor and have the potential to occur in the sediments due to the presence of several point and non-point pollution sources in the area.

For south shore sediments, there are two existing open water disposal options, the MBDS and Cape Cod Bay Disposal Site (CCDS). The MBDS is located about 70 miles northeast of New Bedford, accessible through the Cape Cod Canal (Figure 3-6). The CCDS is also accessible via the Canal, but it is closer to New Bedford, 45 miles, than MBDS (Figure 3-7). Although a direct comparison of chemistry test results to existing open water disposal site reference values is not strictly used to determine sediment suitability, chemistry results can be compared to reference values obtained from sediments near the open water sites. For New Bedford/Fairhaven Harbor and other south shore harbors, the nearest open water site is the CCDS and, therefore, disposal at CCDS would be preferred because of the shorter haul distance. However, the reference sites near MBDS are used here as a benchmark for New Bedford sediments because the sediment chemistry data from MBDS is more comprehensive and reliable than data collected from the CCDS reference area. Generally, the sediment quality guidelines for CCDS are more strict than MBDS.

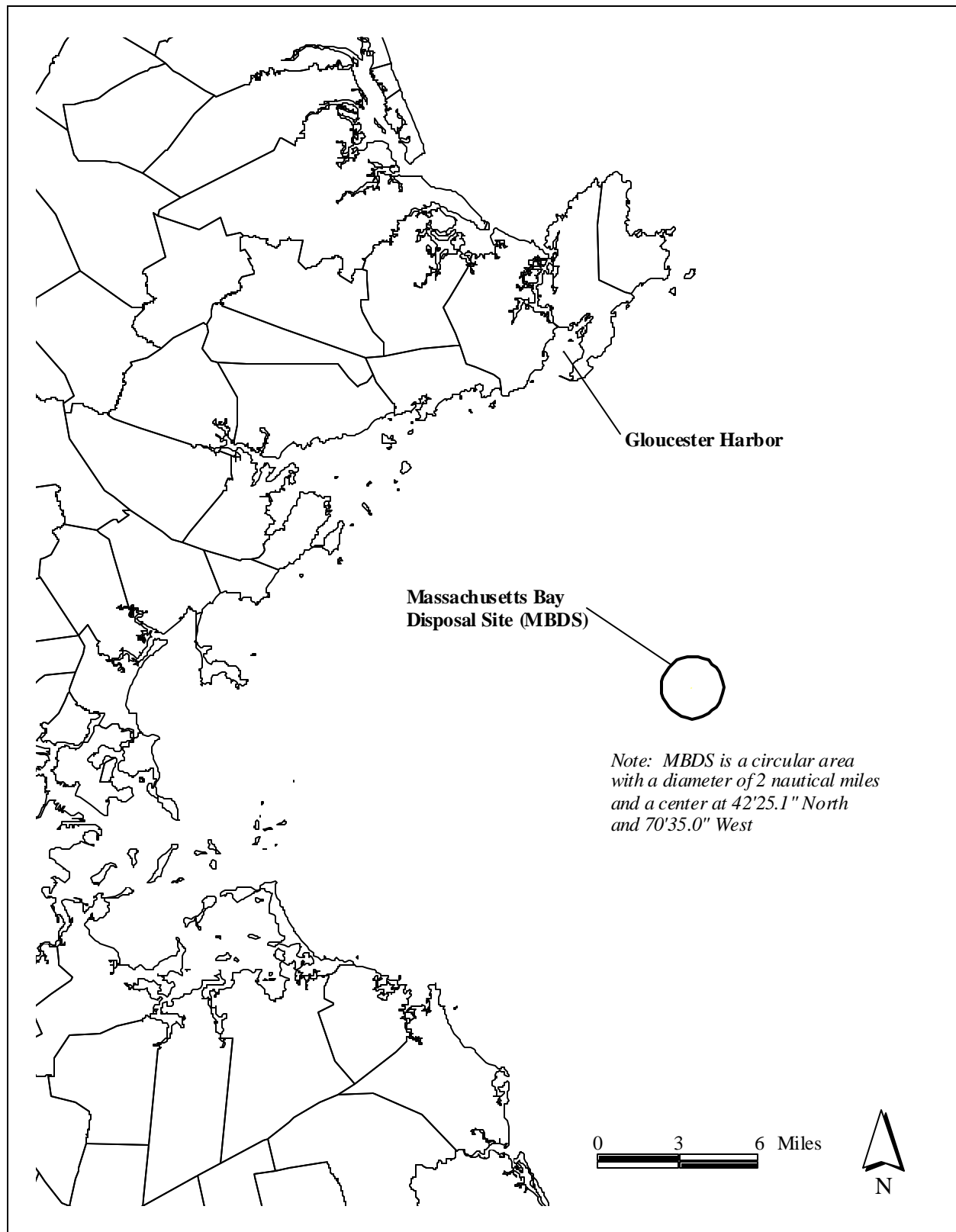


Figure 3-6: Approximate Location of Massachusetts Bay Disposal Site (MBDS)
(Base Map Source: MassGIS)

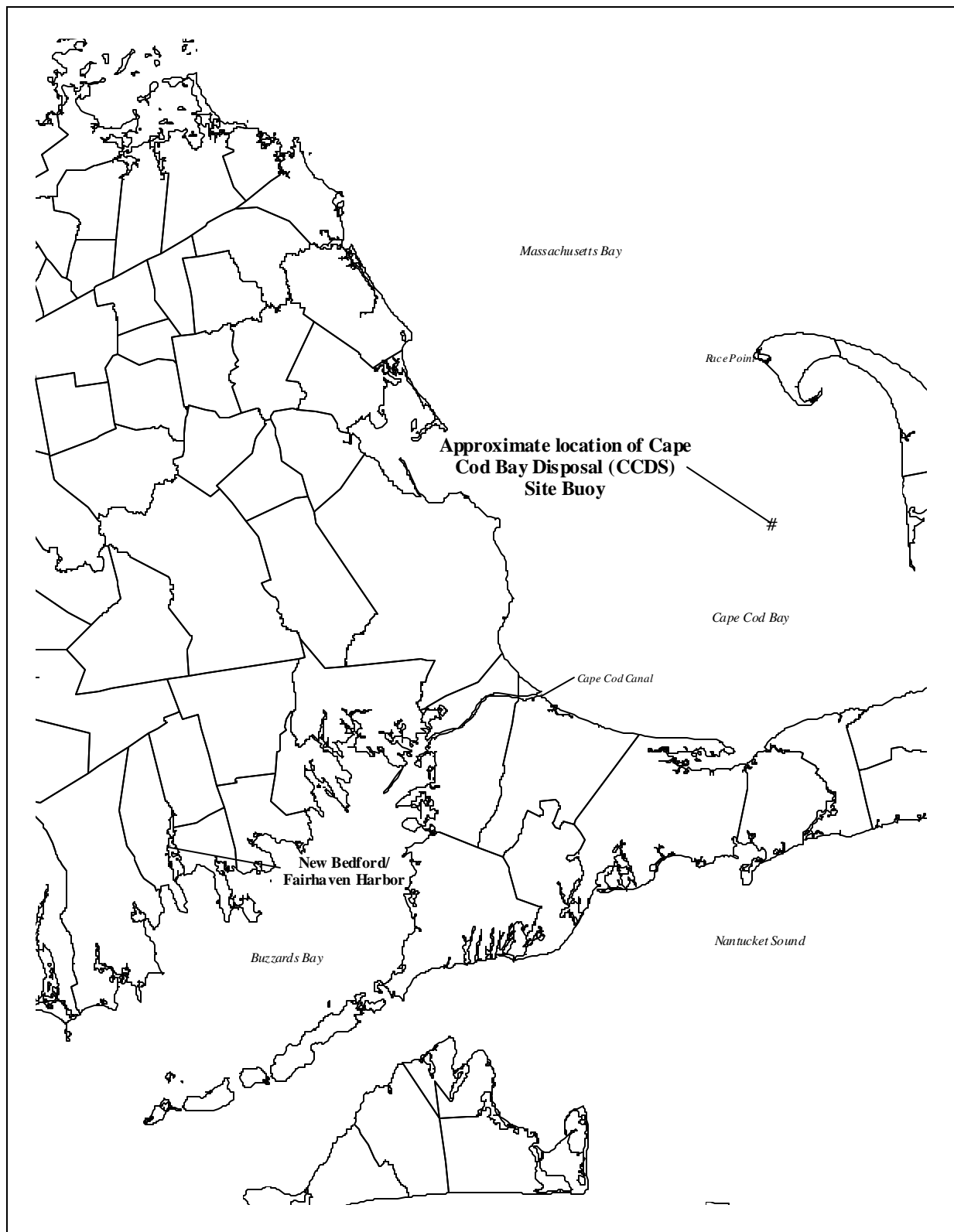


Figure 3-7: Approximate Location of Cape Cod Bay Disposal Site (CCDS) Buoy
(Base Map Source: MassGIS)

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Table 3-2 summarizes the mean (average) concentrations of the metals, PCBs and PAHs in sediments to be dredged from the New Bedford/Fairhaven Harbor channel, maneuvering and anchorage areas.

Table 3-2: Mean Sediment Chemical Concentrations for Federal Channel, Maneuvering and Anchorage Areas in New Bedford/Fairhaven Harbor.

Analyte	Units	Inner Harbor	Outer Harbor	Crow Island (Fairhaven Channel)	Fish Island	MBDS Reference
Copper	ppm	512	127	260	850	32
Lead	ppm	155	64	72	215	66
Total PCBs (Congeners)	ppm	6.7	2.5	2.1	11.8	ng
Total PAH	ppm	11.7	2.0	2.2	14.5	3.0
Total Dioxins/Furans	ppb	4.7	3.1	2.3	5.3	ng

Notes:

Bold denotes values greater than MBDS Reference

MBDS Reference values are mean plus 2 standard deviations

ng = no guideline

Concentrations are averages of samples collected from these areas

Of the eight metals studied, copper and lead are the most prevalent. Mean copper concentrations are four to twenty-seven times higher than the MBDS reference values. Highest concentrations are near Fish Island and in the lower harbor. Lead concentrations are also elevated, but are only abnormally high in the two aforementioned areas. Metals occur naturally in sediment at low concentrations, but point and non-point discharge sources contribute significant amounts of metals to the water and sediment. Most metals have a tendency, once entering the water, to adsorb suspended sediment particles which then settle to the harbor bottom. Potential sources of elevated copper in the harbor include the Revere Copper Products Plant in the upper estuary, other industrial facilities (Figure 3-4), wastewater treatment outfalls and combined sewer outfalls.

Total PAH concentrations exceed the MBDS reference in the Fish Island and lower harbor areas by four and five times, respectively. Polycyclic aromatic hydrocarbons (PAH) are a class of chemicals that are formed by the incomplete combustion of fuel. Sources of PAH include power generation, stormwater runoff, industrial discharge and dry deposition from the atmosphere.

Polychlorinated biphenyls (PCBs) are the main pollutant of concern in New Bedford/Fairhaven Harbor. Sediment concentrations are among the highest encountered in any US waterway. The focus of the Superfund project is the remediation of PCBs in the upper and lower harbor areas. In the upper harbor, sediments containing total PCB concentrations above 10 ppm are targeted for removal and placement in nearshore CDFs in New Bedford. In the lower harbor, sediments containing PCBs in excess of 50 ppm are slated for similar cleanup measures. These remediation areas and potential CDF disposal sites are depicted in Figure 3-5.

All sediments sampled for the DMMP had PCB concentrations below the cleanup levels. The highest concentrations were in the channel area around Fish Island (average 11.8 ppm). Concentrations in the lower harbor averaged 6.7 ppm, while the Fairhaven Channel and outer harbor channel sediments contain PCBs around 2 ppm.

PCBs were once used as cooling fluids in transformers and other electrical equipment. Since 1976, PCBs have been banned from manufacturing and use in the United States due to their potential acute and chronic effect on the environment. The sources of PCB contamination in the harbor are many, however, two past industrial facilities, Aerovox Inc. and Cornell Dubilier, have been implicated by USEPA as the primary sources.

In addition to the high PCB levels in sediment, dioxins and furans, a class of compounds similar in chemical structure and behavior to PCBs, have been found at elevated levels. Their spatial distribution mirrors that of the other contaminants discussed above, i.e. concentrations are highest near Fish Island and the inner harbor and less in the Fairhaven Channel and outer harbor. These compounds are present in Aroclor (PCB) mixtures. They can also be derived from atmospheric fallout from incineration of sewage sludge, and are common by-products of paper bleaching. The PCB discharges and atmospheric incineration are suspected as primary sources of dioxin/furan contamination in the harbor (Pruell, 1990).

Tier III - Biological Testing

In accordance with the EPA protocol discussed in the above section, Tier III biological-effects testing would be required if disposal at either the CCDS or MBDS is proposed. Any private or public dredging project that proposes disposal at either of the above sites must undergo biological testing to determine if sediments are suitable. The biological testing requirements (if any) for disposal at any of the preferred aquatic disposal sites within the Harbor, will be determined at a later date by the appropriate regulatory (state and federal) agencies to prove if sediments are suitable for ocean disposal if material from New Bedford or Fairhaven is proposed for open ocean disposal.

- 1) Suspended particulate phase bioassays;

This test is used to determine the short-term effect of dredging and disposal on sensitive water column organisms. If significant short-term effects are anticipated, then dredging and disposal management restrictions can be employed to minimize impacts.

2) Solid phase toxicity test;

Over a 10-day period, sensitive marine amphipods are exposed to test sediments to determine the acute toxicity (lethality) of the sediment.

3) Solid phase bioaccumulation test;

Sediment dwelling organisms are exposed to test sediments over a 28-day period to determine acute and chronic effects of the sediment. The tissues of surviving organisms are then analyzed for the chemicals of concern.

The results of the above tests are evaluated in accordance with the procedures in the USEPA/USACE protocol. This includes a human and ecological risk assessment conducted by USEPA.

Testing Summary

Testing requirements for the dredging projects proposing to use a DMMP CAD cell will be determined as one component of the management plan.

3.3.2.2 Sediment Quantity - Suitable versus Unsuitable Volumes

The determination of the suitability for sediments for ocean disposal is made by the federal agencies. Normally, the agencies require that biological-effects testing be conducted to make such a determination. For DMMP planning purposes, however, a preliminary determination of suitability is offered in this DEIR. This preliminary determination is based upon a comparison of sediment chemistry results from samples taken within proposed dredging projects and with results from MBDS reference sites and other sediment guidelines such as those developed by NOAA and the New England River Basins Commission (NERBC).

Sediment chemistry data presented in this section for the major dredging projects in the New Bedford/Fairhaven federal navigation areas were used to evaluate those specific project areas, but this data is also useful in assessing the suitability of sediments at nearby facilities that have expressed an interest in dredging. Those facilities that are distant from any sampling locations were assessed based on: historic sediment quality data (if any); proximity to pollution sources; and, general oceanographic conditions, i.e. is the site within a high or low energy environment.

Given the sediment chemistry data presented above, it is assumed that all sediments from New Bedford/Fairhaven would be unsuitable for ocean disposal at MBDS. Sediments in the lower harbor channel and near Fish Island contain elevated concentrations of metals, PCBs, PAH, and dioxins/furans that would likely render them unsuitable for ocean disposal. Sediments in the Fairhaven channel and in the outer harbor channel contain considerably less contamination, however, these contaminants are still present in measurable quantities, therefore, to be conservative, they are also assumed to be unsuitable for ocean disposal.

The sediments contain bioaccumulative contaminants that would render them undesirable for beneficial habitat reuse. Beach nourishment is impracticable because the sediments are fine grained, not coarse grained (sand) that is required for beach replenishment. The silty nature of the sediments is suitable for salt marsh or mud flat creation, the presence of highly bioaccumulative contaminants in the sediments, particularly PCBs, dioxins and furans, could cause negative biological effects if organisms are exposed to this substrate in the intertidal zone.

Given the assumptions presented above, it is estimated that approximately 960,000 cy of sediment to be dredged from New Bedford/Fairhaven Harbor over the next ten years would be UDM.

Table 3-3: Dredged material volumes (cy) for New Bedford/Fairhaven Harbor for next ten years

Baseline Dredging Demand	Suitable Dredged Material¹	Unsuitable Dredged Material²
960,000	0	960,000

¹ Suitable for disposal at MBDS

² Not suitable for disposal at MBDS

Table 3-4 portrays the timing estimates for disposal of UDM from New Bedford/Fairhaven Harbor. As shown, the majority of the UDM would be dredged in the first 5 years. These projects include primarily the private and public non-federal navigation areas. Dredging in the outyears would consist of the federal maintenance dredging projects.

Table 3-4: Ten Year Dredged Material Volume (cy) Breakdown in 5-Year Increments

Years 1-5	Years 6-10	Total
680,000	280,000	960,000

3.4 Harbor Plan Implementation

New development proposed in the Harbor Plan will strengthen New Bedford/Fairhaven Harbor as a tourism center. The Harbor Plan is designed to comprehensively integrate New Bedford and Fairhaven goals and objectives regarding tourism, public access, land and water transportation, commercial and industrial marine economic development, remediation of environmental impacts from infrastructure and past human-use impacts. The identification of the need for dredging to implement New Bedford/Fairhaven Harbor Plan recommendations and the characterization of a portion of the dredged material in the DMMP as UDM, underscores the importance of locating a cost-effective environmentally sound disposal option for UDM to help the City, Town and the Commonwealth meet the mission statement of the Harbor Plan. Identification of a practicable UDM disposal option will help attain both Communities' vision of maintaining a vibrant seaport, while preserving New Bedford and Fairhaven's maritime heritage, and furthering economic development.

The Harbor Plan also supports maintenance and improvement dredging activities as well as the concept of aquatic disposal of UDM. Selection of a disposal site for UDM, as a concept, is supported by the New Bedford/Fairhaven Harbor Plan, which recommends the pursuit of the maintenance and improvement dredging projects in the harbor and the establishment of one or more disposal sites for the UDM generated from these projects.